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PAPERWORK: WHAT IS THE MAGNITUDE OF THE PROBLEM, IS THERE A SOLUTION?

HARRISON W. DAVIDSON

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PAPERWORK: WHAT IS THE MAGNITUDE OF THE PROBLEM, IS THERE A SOLUTION?

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Harrison W. Davidson, Jr.

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by

Harrison W. Davidson, Jr.

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Commander, United States Navy

Submitted in partial fulfillment of
the requirements for the degree of

MASTER OF SCIENCE
IN
MANAGEMENT

United States Naval Postgraduate School
Monterey, California

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Harrison W. Davidson, Jr.

This work is accepted as fulfilling
the research paper requirements for the degree of
MASTER OF SCIENCE
IN
MANAGEMENT
from the
United States Naval Postgraduate School

ABSTRACT

The rising tide of paperwork which has engulfed the management community in recent years has created increased interest in the problem because of soaring overhead costs, disruption of information systems, and other resultant inefficiencies. Growth, trends and the results of paperwork during the past ten years, were examined from the viewpoint of business, the Federal Government and the United States Navy. The causes of paperwork, presently available tools of records management, and emerging developments to aid information systems were investigated to obtain a broad overview of paperwork, its magnitude and approaches to a solution

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CHAPTER I

THE PROBLEM

Introduction

To paraphrase Mark Twain, everyone talks about the paperwork problem, but no one does anything about it.[1] Certainly every Naval Officer, manager, or other executive is aware of the demands on his time and resulting inefficiency created by endless chains of burdensome paperwork. Yet the necessary by-product of any important item of information is its reduction to some readily available, recorded form--a record. The preparation, review, storage, accessibility, and other actions associated with these constantly increasing records are, however, becoming a staggering problem as the organizations and technologies of our society expand. Although frequent articles from newspapers and periodicals or an occasional government investigation reveal shocking statistics related to some area of paperwork, there are publicly available, few explicit statements of the ramifications of the problem or courses of action for solution.

Importance of the Study

The creation of written information has become an extremely simple task with thousands of people and machines contributing daily to the total output. The decision making value or other usefulness of these records is eliminated unless they can be rapidly retrieved and processed. Unless the total process is recognized as one of importance and is properly controlled, the process will go out of control. This recognition has been growing

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[1] This investigator had originally used the phrase in proposing the study and was not surprised to discover subsequently the almost identical use by another writer. [8]

in recent years by many who face uncontrolled paperwork systems. They have become aware of the lack of control information and research devoted to the problem.

In response to this growing awareness of excess, uncontrolled paperwork and the need for research in the field, this study was undertaken as a broad examination of the paperwork problem with the hope that many detailed studies will be forthcoming.

Statement of the Problem

It was the purpose of this study to investigate and present current information which would (1) point out the volume of paperwork now faced by all phases of the managerial community, (2) to show whether or not a part of the total effort was resulting in inefficiency and waste of resources, (3) to inspire the desire to improve paperwork management and management information systems if such inefficiency and waste exists, and (4) to present a review of tested procedures presently available as well as emerging tools for solving paperwork problems.

Definitions, Abbreviations and Explanations

Automatic Data Processing (ADP) - The term used to refer collectively to all of the various data processing systems, computers, electronic accounting machines, etc.

Electronic Accounting Machines (EAM) - Tabulating machines which employ punch cards for the automatic processing of business transactions but are not considered to be computer systems.

Electronic Data Processing (EDP) - Electronic computers which perform basic mathematical and comparative operations at high rates of speed to automatically process data. Computers consists of an input unit, processor, and an output unit, as well as other

peripheral equipment for processing the data medium; punch cards, paper tape, or magnetic tape. Digital computers are used primarily for business systems while analog computers are most useful for engineering work.

Integrated Data Processing (IDP) - A system of tying together information handling operations and office machines used to perform the operations by transferring data automatically from machine to machine through a common medium.

The (Federal) Paperwork Jungle - A term which has gained popular acceptance to describe the paperwork problem in the United States, or a synonym for "red tape" of government origin. "The Paperwork Jungle" was the title of a speech delivered by Representative Arnold Olsen on February 8, 1964, to the House of Representatives. In this paper, the term refers to the report of, and hearings before, the Subcommittee on Census and Government Statistics of the Committee on Post Office and Civil Service, House of Representatives, Eighty-Eighth Congress, Second Session.

Paperwork Management - Records management and paperwork management are synonomous. "Paperwork management" was created by the government in order to broaden the concept of records management which had been improperly regarded to mean only the movement of records to storage and eventual disposal.

Records Management - "The systematic control over the creation, maintenance, retention, protection and preservation of records for the purpose of reducing costs, increasing efficiency, and servicing management through records handling operations." [3:4]

SCRAP - An acronym from SELECTIVE CURTAILMENT OF REPORTS AND PAPERWORK, a program instituted in the U. S. Navy to attack the

paperwork problem.

Source Data Automation (SDA) - The original, initial recording of source data as a machine input medium, rather than as a report or other record, to permit automatic handling of information from the beginning to the end of the paperwork cycle.

Systems Analysis - The systematic examination of records or paperwork handling procedures with the goal of making these systems more economical and efficient. These examinations, while normally conducted by office managers, records managers, or consultants, are not restricted to a particular group and may include the more rigorous disciplines becoming available in Industrial Engineering, Operations Research, and Cybernetics, not discussed in this study.

Reference Style - The reference style used in the study was similar to that which has been adopted by many scientific and engineering institutions.[1] The bibliography was ordered in the conventional manner. For example, [3:21] refers to bibliographical entry number three, page twenty-one.

Limitations of the Study

The primary limitation imposed upon the investigation was a lack of time available to devote to a field described by one respondent as: "...a subject of limitless possibilities...as broad as contemporary man's total effort."[2] This was particularly true since the study was accomplished concurrently with a one year course in Economics and Business Administration. The necessity of

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[1] Kate L. Turabian, A Manual for Writers of Term Papers, Theses, and Dissertations (Chicago: The University of Chicago Press, 1955) p. 69.
Writing Guide for Naval Officers (Washington: Bureau of Naval Personnel, 1958) p. 17.

[2] See Appendix.

time for extended research into paperwork is caused by the relatively small amount of previous research effort, the widespread scattering of bits and pieces of essential information and the diverse research techniques which can be readily applied in the investigation of such a subject.

CHAPTER II

SUMMARY OF SELECTED RELATED REFERENCES

Historical Background

The heredity of present day paperwork and records might be traced from man's necessity to communicate, his acquisition of more efficient and rapid recording devices, and his fetish for the preservation of knowledge and important information for the generations of the future.

With the birth of the scientific management movement, emphasis was centered on the principles of efficiency and control, and the development of such practices as forms design, filing systems, rapid transcription of information, etc. Management and Business Administration since then have sought more and more after an ultimate system of management information. As Society's affluence and technology has expanded, however, the paper tools of management have more than maintained the pace, producing gigantic volumes of advertising, interoffice memos, business letters, forms, questionnaires, charts, graphs, records, records of records, ad infinitum. Business was not alone in its prodigious output of paper.

The United States Government's interest reaches as far back as 1810 with the formation of a Congressional Committee responsible for determining the disposition and orderly preservation of public documents. The emphasis at that time was on archiving, and although the dimensions of paperwork have increased greatly, records preservation is still an important and costly responsibility.

First attention to the problems of unnecessary reports and duplication of statistical effort occurred in 1908 with President

Theodore Roosevelt's Executive Order 937 which created the Inter-departmental Statistical Committee under the Secretary of Commerce and Labor "to make recommendations with a view to eliminating unnecessary duplication of work and conflicting results."

In the 1920's, mounting Federal reports and records, many generated by World War I, were responsible for the Budget and Accounting Act of 1921 (31 U.S.C. 18) which created the Bureau of the Budget, and the Act of May 11, 1922 (44 U.S.C. 220). One purpose of these Acts was to place controls over the ever increasing flow of reports, records, and publications.

Increased attention was devoted to the paperwork burden imposed on business and industry by Federal statistical agencies in the 1930's, and in 1940 this attention was focused on the reporting burden placed upon the American small businessman. The aftermath of "emergency" reporting created by World War II resulted in the Federal Reports Act of 1942 (5 U.S.C. 139). This legislation is today the basic statistical law of the land.

In large measure, recognition of the paperwork problem in Government was the result of the work of Emmett Leahy who headed the Navy Office Methods Division in World War II. Mr. Leahy was cited for records management programs development which resulted in savings of $21 million in four years. [3:6] The first Hoover Commission continued the investigation into the statistical work of the Federal Government and its "Task Force Report on Statistical Agencies," headed by Leahy, offerred some 28 recommendations for improving the statistical system and its services to the public.

The second Hoover Commission was established by Congress in July 1953 and one of its objectives was to deal more specifically with the paperwork burden imposed on the public and business by Federal Agencies. The Commission's "Report of the Task Force on Paperwork Management" is still one of the most explicit statements of waste associated with unnecessary paperwork. According to the report, the completed cases of the task force would have resulted in annual savings to the Government of $5 million and an estimated $10 million saving to industry. The predicted obtainable savings from extending efficient records management programs throughout government was estimated at $255 million. [12:VII-3, VI-15]

> In the business world, as in the Federal and State governments just before and during World War II, two forces have affected growth of the specialized field of records management. The first of these forces was the interest of the archivists and historians in preserving important records. This emphasis began a quarter century ago. Now it is believed that records of business form a part of our cultural inheritance.
>
> The second, and more powerful of the forces, was the impact of the growing volume of records that aroused top management to consider the possibility of reducing the cost of space, equipment, and personnel involved in handling records.
>
> The newly developed force is the belief that business is an information and idea system and records are management's memory. [3:9]

Sources Searched and Standards of Selection

This paper deals specifically with the developments relating to paperwork and records management since 1955 and begins with the findings of the Task Force on Paperwork Management, Commission on Organization of the Executive Branch of the Government, 1955. [12] Sources were sought pertaining to three areas, (1) the Federal Government, (2) the United States business community, and (3) The United States Navy. Sources dealt primarily with the scope of

paperwork and records management practices, and office and business equipment including ADP/EDP equipment. Selected sources include applicable information from:

(1) The Federal Paperwork Jungle, hearings and report. [13, 15]

(2) Textbooks and handbooks of records and office management, and Industrial engineering and management.

(3) Periodical literature.

(4) Newspaper articles.

(5) Official published and unpublished documents of the U. S. Navy.

(6) Direct inquiry of authorative persons.

(7) Miscellaneous.

The search of the literature revealed few formal sources dealing explicitly with paperwork and records management. The field is normally referred to in specific areas by periodical and newspaper articles and in a general sense by writings pertaining to industrial management and office management. The two most recent studies of the field reputed to be of the deepest scope and intensity were not available to the researcher. These studies are (1) Stanford Research Institute's Long Range Planning Report Number 218, "The Office Paper Explosion," which is available as part of a research service to companies on an annual contract basis,[1] and (2) a comprehensive study of American paperwork standards conducted by the American Records Management Institute and Columbia University, published in 1956. [11]

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[1] See Appendix.

CHAPTER III

METHODS AND PROCEDURES

Methods

Investigation of the problem of this study is amenable to many research methods. Primarily because of the time limitation however, the methods utilized were limited, to (1) historical research of currently available literature to investigate and define trends in the growth of paperwork and developments in the field of records management; (2) Critical research in selecting sources of information for comparison against the standards of accepted management practices; and the major method (3) synthesis, to assemble a consensus of factual evidence and authorative opinion from diverse areas of the field into an integrated study.

Procedures

The investigator conducted a search of general references, library card indexes, and library vertical files in the areas of Management, Business Administration, Paperwork, Records, Office Management, Industrial Engineering, Data Processing, and related subjects. Few sources were found to deal directly with the field. Most references concentrated on general office procedures, forms design and use, and work procedures. Much more material was available concerning functions and applicability of automated systems. Concurrent with the search for reference material, letters were written to several persons deemed to be authoratative in the realm of paperwork within Government, business and the U. S. Navy. The respondents included:

(1) The U. S. Chamber of Commerce.

(2) Stanford Research Institute.

(3) S.C.M. Data Processing Corporation.

(4) A Congressional Subcommittee conducting hearings on paperwork.

(5) U. S. State Department, Reproductions Branch.

(6) Administrative Office, U. S. Navy Department

(7) Project SCRAP, U. S. Navy.

These inquiries sought sources and references with which the respondents might be familiar in their respective fields. The replies in some instances were accompanied with pertinent and useful data and all were extremely fruitful in directing attention to valuable sources of information which resulted in the larger portion of the final bibliography of the study.[1]

From the integrated list of sources all references which were obtainable were assembled and reviewed for pertinance and applicability to the investigation. The final group of materials was critically analyzed and integrated to synthesize the results of the study and the resulting conclusions.

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[1] The appendix contains four of the replies from respondents.

CHAPTER IV

THE STUDY

The Volume and Ramifications of Excess Paperwork

In Business. Few if any organizations can exist without paperwork and records. As an extension of management's memory and knowledge, the costs associated with this essential burden can be easily justified, but economically inefficient handling of paperwork cannot be justified. Every piece of paper uselessly generated or held beyond its period of value represents economic waste through needless overhead expenses. As the volume of paper and records increase, the chance for such needless expense increases and the ability to discern the cost becomes more difficult. In the past few years this volume of paper has reached astronomical proportions.

The second Hoover Commission reported in 1955 that U. S. business filed, stored, and maintained over one trillion pieces of paper at a cost of one cent per sheet annually, and added to the files at a rate of 175 billion sheets each year, enough to fill 60 million file drawers. The office furniture industry indicates that 50 million steel, letter filing drawers alone are actually in use. [24] It has been estimated further that the United States now uses over 345 billion pieces of paper annually, computed by considering a national average of five file drawers of all kinds in use for each white collar worker, with each drawer containing 3000 papers, and multiplying this result by the 23 million U. S. white collar workers. [5]

An example of how this volume continues to grow may be seen in an innovation in office equipment developed only since World

War II, the office copier. Over 400,000 of these machines in the U. S. now use $150 million annually in supplies, and produce 10 billion sheets at a total cost of $500 million. [24] Storage space shrinks as new information is created and archives continue to grow. The world output of purely scientific information is growing at about 5 percent per year, thus in fifteen years, the output of information will again double. [24] The Sterling Memorial Library of Yale University houses 3 million volumes and is increasing at the rate of 100,000 units each year, while the Library of Congress, collecting since 1800, requires 270 miles of shelves to house its 42 million books, pamphlets, and manuscripts. [24, 28]

Several years ago a major airline was forced, in the course of an investigation by a Federal agency, to save all of its files. In four years the total file volume doubled, and if placed in a single stack would have reached an aircraft flying at an altitude of 25,000 feet. An airline of this size would normally have 10,000 cubic feet or 1,700, four-drawer file cabinets of files while a similar large, non-regulated, company would require 2,000 cubic feet of file space. [7] The documents and drawings required to design and build the Boeing 707 jet passenger aircraft weighed 50,000 pounds--approximately half of the weight of the complete aircraft itself. [5]

A normal manufacturing company deals with 200 to 250 different elements of information but may use from 500 to 1500 forms in dealing with these elements. Larger companies have a much more complex problem. The Chrysler Corporation, for instance, handles about one million pieces of paper daily. [28] A leading consultant indicated that unfortunately, a large volume of information filed and stored

by business firms was worthless or obsolete. He stated that a firm of 250 employees has 561,000 obsolete pieces of paper filed, and a company employing 5000 workers handled as many as 11 million worthless documents. Of these files a maximum of 15 to 20 percent of the items are ever required for reference, and 90 percent of the material referred to relates to documents less than one year old. [37]

The rapid increase and sheer volume of excess paper creates unnecessary costs and waste in numerous ways. The cost of space, the increasing cost of processing paper, the increase in clerical workers and the waste of executive time must all be considered. One expert calls paperwork the largest single item of overhead expense of most companies and further indicated that as high as 65 cents of each $1.00 spent is wasted.[1] He holds that the average company, based on the experience of a consulting group, pays $1.45 more than is really necessary to process an invoice, $1.58 too much for the average bill, and 45 cents too much for each pay check issued. This at the company level would have an average retailer with a $100,000 annual payroll wasting $14,000 annually, an average manufacturing company of one million payroll annually wasting $75,000 in excess paperwork, and a corporation with a $25 million yearly payroll wasting $3.5 million in the office. [11]

The large growth in clerical workers has created an additional expense factor to be considered. Earnings of this group are higher than ever, yet their productivity has been considered not to have risen commensurately with salaries. [28] 1960 saw a doubling of

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[1] Arthur Barcan, Records Management Institute. [11]

this group since 1940. The last census indicated a 21.2 percent increase in clerical help in the 1950's. During the last 50 years which produced a 700 percent increase in industrial production, factory workers increased only 85 percent while office workers increased 450 percent.[28]

Today, the salesman and engineer spend more than one-fourth of their working time filling out forms and reports for the office, and filling out a form, on the average, costs 20 times as much as the cost of the form itself. The cost of a business letter has risen from $1.17 ten years ago to greater than $2.00 at the present. All of these costs add to the paper overhead.[5]

The cost of maintaining files varies, however. The data indicated annual costs from $60 to $75 per 5000 sheet file drawer, to $140 for a four drawer file cabinet of 3000 sheets per drawer. This included space, labor and overhead.[7, 24] The total yearly cost to U. S. business at these rates is at least $4 billion dollars. About $1 billion is spent every year for business forms. According to the best estimates available, business is spending $11 billion annually on paperwork. The lack of concern for excess paperwork is costing business over $600 million wasted dollars every year.[8, 11, 13, 24]

In The Federal Government. The Federal Government can easily provide monumental statistics to match or surpass those of business with regard to paperwork. For instance, in 1954, if all Government files could have been placed in a single drawer, it would have stretched from Washington to Moscow and:

> The creation of Federal records between 1954 and 1963 increased from 3 million cubic feet per year to 4.5 million, or from half a million file cabinets to three-quarters of a million and from 6.5 billion pieces of paper to 10 billion. During the same period, records storage holdings have been held at 24.5 million cubic feet or somewhat over 4 million file cabinets and some 40 billion pieces of paper. [15:51]

Nevertheless, the Government is faced with the same type and range of costs as is business. In 1955 the cost of internal paperwork was placed at $4 billion. The estimate today is considerably higher, ranging up to nearly $7 billion dollars "Exclusive of processing and compiling reports, the cost of internal agency paperwork is estimated at $3 billion a year." [15:50]

Federal paperwork has become practically institutionalized. The system systematically and routinely generates thousands of new "public use" forms yearly. In 1963 only 3 percent of these new forms reviewed by the Bureau of the Budget were disapproved. One reason for this proliferation of paper lies in the fact that fact-finding and statistical activities of Federal agencies has mushroomed in recent years because of the growth of the Federal Government itself and the entrance of the Federal Government into areas formerly cared for by State and local governments. The Federal agencies fall into two broad categories, (1) about 20 bureaus, boards, commissions, etc., having a significant responsibility for statistical collection, compiling and publishing, and (2) the other agencies, not responsible for statistical information, which nevertheless collect and compile data for regulatory, administrative or operations purposes.

Federal expenditures for statistical purposes more than doubled since 1953 and totaled $113,700,000 in fiscal year 1963. Personnel

and salary costs can be generally equated to the volume of paperwork of an agency, and the data for the Federal statistical activities show an increase from 11,226 employees in 1959 to 15,373 in 1963 with the annual salary cost rising from $60,815,718 to $81,701,921 for the same period.

Another significant source of Federal paperwork was found in the widespread use of statistical and survey contractors, including data processing operations. These activities, only developed within the past ten years, are now funded at some $35 million over a two year period and account for about 15 percent of all statistical expenditure.

The public supports the governmental factfinding, regulatory, and statistical systems in two ways: first, as respondents furnishing information, and second, as taxpayers whose tax money supports the agency programs which generate the need for data. Purely statistical reports, however, account for a relatively small volume of the paperwork load placed upon business, industry, and the public. Most of the paperwork burden originates in the administrative and regulatory agencies rather than in the statistical agencies. In 1956 the Bureau of the Budget estimated that 80 percent of forms and reports were created by the former group of agencies and 20 percent by the latter group. Presently this ratio is two-thirds to one-third. A summary tabulation of Federal reports and forms approved for circulation to the public as of March 1964 showed 3,800 reports which created 182 million annual responses. The tabulation includes repetitive and statistical forms but excludes "one time" forms, those used by agencies exempt from the Federal Reports Act, and those of regulatory agencies which claim exemption from the act.

Thus, the data shown is actually less than one-third of the total volume of Federal reports in circulation as of March 1964. The total of all Federal reports easily reaches over 800 million, or more than 4 for each member of the population. With the addition of single-use forms, supplements, corrections, and other items, the total reaches well over 1 billion items and does not include copies, duplicates, and other pieces of paper the systems require. The fantastic dimensions of the Federal reporting system are more readily revealed by the 2.25 billion various forms printed by the Government Printing Office for eight departments and agencies in 1964 at a total cost of $10 million.

It is difficult to obtain an exact estimate of agency costs with respect to reports and surveys, however, partial reports permit deriving a "minimal" estimate of $327 million for fiscal year 1964. This estimate probably represents a small fraction of total paperwork costs since it excludes internal-use records, forms, and reports as well as costs of general correspondence. A 1959 Subcommittee for Post Office and Civil Service, report, stated: "a decision by a Federal data collection agency to spend $1.00 of public funds may generate a respondent cost of $10 to $100." [15:46] If the 1955 Hoover Commission estimate of $1.6 billion cost of forms and reports is multiplied by 10, a 1955 public cost of $16 billion is obtained. Paperwork expansion since 1955 would place the 1964 figure at $20 billion or 3 percent of the gross national product. The figure may seem high, however testimony before the recent Paperwork Jungle subcommittee revealed: a Federal Power Commission questionnaire of 428 pages, weighing 10 pounds, which cost some respondents up to $250,000 to complete; testimony of two New York

banks of costs of $64,000 to complete and mail statements of social security identification information required by Treasury Form 1099; and the estimate of the subcommittee that Internal Revenue Service form 1040 alone cost the public $1 billion to complete.

> Whether the $20 billion figure is high or low, it represents an enormous expenditure of public resources... (which) add ponderously to the cost of Government to the public. And this cost is apart and aside from State and local government respondent costs. [15:47]

In The United States Navy. The Navy as an agency of Government finds itself also susceptible to the same type and range of paperwork costs found in other agencies and in business. An additional factor is an underlying philosophy which periodically creeps into naval thinking and creates increased paperwork. This philosophy refuses to accept results as proof of accomplishment, but requires excessive and oppressive documentation of each step along the way. "A blind fascination with administrative detail as an end rather than a means; a compulsive dedication to the word rather than the deed." [29] This process has led to an altogether too familiar practice known as gundecking. The word is based on an ancient and legitimate practice in which the journals and logs of the old sailing ships were recorded, in retrospect, in the relative peace of the berthing space on the gun deck rather than being kept under the pressure of the days operations. Today, gundecking, could mean excess paperwork since it is:

> ...essentially, the creation of spurious records and logs, etc., in order to deceive (i.e., impress) an official inspection team during an administrative, operational readiness, Board of Inspection and Survey, Pre-Deployment, Post-Deployment, or Fleet Training Group inspection. Or to keep the Commanding Officer happy. [21]

There are other attitudes which have increased the paperwork burden

which could be described as (1) the don't be caught short idea, i.e., keep one or more of every document regardless of value, and (2) keep everyone informed of everything at all times.

In addition to economic waste and the cost of government to the taxpayer caused by excess paperwork, the Navy is undergoing a period of rapidly expanding technology requiring more and more expensively trained technicians and it can ill-afford to devote increased manpower to paper objectives. The normal cost of paperwork within the Department would be extremely difficult to estimate. Another, and more important area of costs, is impossible to estimate and is of far greater importance -- that is the serious effect of the paperwork burden on mission and combat effectiveness of the Service. This threat was recognized by the Secretary of the Navy, in May 1964 when he took steps to combat the problem, with the establishment of a program called Project SCRAP. The project was placed on a par with the Polaris missile and the Anti-Submarine Warfare projects. The directive establishing Project SCRAP very succinctly discussed the effects of excessive paperwork:

> a. Paperwork in the operating forces has grown to an almost insurmountable burden.
>
> b. This burden stems from many sources including, the Navy Department, a growing host of decentralized and quasi-autonomous activities, both naval and private, and the operational and administrative commanders of the fleet.
>
> c. The paperwork burden consumes valuable time and effort of fleet personnel at the expense of training, readiness, maintenance, and professional development. It adversely affects morale and retention. Its sheer bulk and complexity nullifies administrative efficiency. Costs are increased. The net effect is a serious threat to combat readiness.
>
> d. This growing threat to combat readiness dictates a need for a drastic and vigorous program, fully

> supported through the Department. Without such an approach, current efforts will result only in more paperwork.
>
> e. It is the opinion of the Secretary of the Navy that the seriousness of the problem has reached a level to warrant extraordinary action. [16]

A letter which emanated from the project SCRAP office after the program's inception added further insight into the paperwork problem:

> One accompaniment of technological growth, of an increased tempo of operations, or an increase in size or complexity of an organization is an increase in the reporting requirements and paperwork leveled on all echelons of an organization, be it governmental or private. Perhaps this is inevitable, but unless given attention by the top executives of an organization, growth of reporting requirements and paperwork can accelerate at an alarming rate. When this occurs, overhead requirements are increased to the point that they become too expensive in terms of funds, manpower, and space.
>
> This effect was particularly noticeable in the fleets where, because of fairly fixed manning limitations, the increased paperwork burden has been shown to consume time and effort of fleet personnel at the expense of training, readiness, maintenance, and professional development, and thus to directly affect combat readiness. Evidence that such a situation had been developing in the Navy led the Secretary of the Navy this past summer to create a special, personally controlled project for the purpose of decreasing the burden of reports and paperwork in the Navy. [18]

The Basic Reasons for Excess Paperwork

Many examples have been cited to indicate the proportions of the paperwork explosion within the past ten years. In 1960, a leading business magazine conducted a survey of 275 companies of various size and varieties of business. Nearly all had already instituted, or were in the process of initiating, some form of more effective records management programs, in order *to cut costs, to remain competitive, and to provide better customer goods or*

services.[28]. In 1964, the Federal Paperwork Jungle hearings revealed increasing inefficiency in Federal agency paperwork procedures in spite of minor gains resulting from previous investigations, legislation, and controls. The report indicated that:

> We are now, apparently, in another period of mass paperwork expansion, and, ...the time has come to examine carefully the existing controls and deterrents and to find out why they are not more effective...
>
> ....
>
> (1) Business, industry, and the general public are becoming increasingly irritated with the ever-growing volume of Federal reports ...
> (2) Federal efforts to control mounting paperwork are and have been largely ineffective. [15:13, 62]

Also, in 1964, the U. S. Navy and other defense department activities undertook a massive attack on the paperwork burden in an effort to prevent the erosion of combat readiness, and to improve efficiency, retention of personnel, and morale.

These are the reasons primarily responsible for the burgeoning tide of paperwork:

(1) There has been a great lack of concern on the part of top management for the magnitude and cost associated with the problem. Consequently, it was considered a necessary evil, handled in a dilatory manner, and controlled by default.

(2) The most knowledgeable people in the field of records management were not considered for, nor have they reached, the top management positions which the field often requires.

(3) Misconceptions on the part of management for the need, or the laws relating to, extended retention of documents.

(4) The increased complexity and decentralization of organizations which demand increased communication of

information, and generates greater amounts of recording, bookkeeping, correspondence, reports and other records.

(5) Increasing demands of the Government for information and the lack of knowledge of managers as to what is mandatory and not mandatory.

(6) The amazing ease with which paperwork can now be created and the variety of new machines available to assist in its production.

(7) The false translation of "tough management policy" into a variety of records, reports and other papers.

(8) The psychological aspects of paperwork.

   a. The assumption that the written word lends validity.

   b. The notion that writing it on paper pins down responsibility.

   c. The status symbol of paper; being in the know, having a letter from the boss, etc.

   d. The generating of excessive memos by "reputation builders" and "alibi fixers."

(9) Weak systems and procedures.

(10) The resistance to change from present systems.

(11) The shortage of "skilled" clerical workers.

(12) Ineffective supervision.

(13) Neglect for application to the office of the engineering and personnel methods which proved so effective in production and industrial processes, such as:

   a. Work measurement.

   b. Performance standards.

   c. Work flow analysis.

    d. Work simplification.
    e. Incentives, etc.

(14) The lack of coordination between departments and the splintering of activities in organizations.

(15) Poor training of clerical workers.

(16) Overstaffing of office personnel and lack of regard for leveling peak work loads.

(17) Misuse of equipment and failure to update equipment.

(18) Permitting EDP equipment to add to the paperwork burden.

Attacking the Paperwork Problem

Listing the causes of a problem is tantamount to stating the solution to the problem, however, in paperwork or records management as in other activities, many methods of approach and many useful tools may be successfully applied in various degrees. Today there are some 4000 systems and procedures analysts available to engage the paperwork problem. The number of consultants has doubled in the past decade. The successful attack upon paperwork normally will take the form of a prescription which is applicable to a particular organization's operations, but the ingredients are available for use whether arranged by members of the organization or by outside consultants.

Recognizing the Problem. Symptoms of the need for an improved records management program are normally apparent in the form of a shortage of record storage space, the periodic purchase of additional filing equipment, production and office delays occasioned by poor paperwork procedures, delay in retrieval of needed information, and other factors, all of which can be translated into costs. Reporting these costs to top management is a primary step. Although, the

leading executives may be unaware of the details of records handling, they are imminently aware of the effects of excessive costs in any phase of the organization's operations and are desirous of remedial action in the areas needed. Those who are aware of the excessive costs of poor paperwork procedures should insure that the facts are made known. Once top management is aware of the problem, the primary hurdle has been overcome.

Systems Analysis. The initial step in a more efficient records management program, after a decision for its need, is to analyze and implement efficient systems which will carry out the objectives of the organization.

In any organized structure of our present economy, be it business or government the paperwork systems will fall into two general classes: business systems, and administrative systems. Business systems, for purposes of this study, refer to repetitive office or paperwork operations which initiate, record, follow up, or retain information directly associated with the actions which constitute the major activities of the organization. These activities are the order input, invoice, accounting, billing and other actions which are an essential part of the production or service rendered. These are the operations which are amenable to techniques of the "plant" or industrial process. The system must be examined and structured as production processes, utilizing tested procedures such as assembly line methods, operator selection and training, automated methods, etc.

The other paperwork system, administrative procedure, is used to define all other paperwork activities generally of a non-continuous, or periodic nature which involve the general

correspondence, reporting, routine office operations, "exceptional" management information and unpredictable administrative actions of the unit. These operations are less amenable to a systematic routine but through proper evaluation and descriptions can be placed and measured by the common systems concept into a logical place in the total system.

Consider the system process as a whole. Consider (1) the possibility of eliminating major groups of procedures and operations, then (2) specific procedures and tasks. Don't attempt to improve an activity which can be eliminated. Look at work which cannot be eliminated and seek to simplify it by rearranging, combining, dividing or streamlining procedures, tasks or documents.

Cost reduction is accomplished by changing something. First, recognize things which can be changed--that are worth the effort involved. Observation and analysis must be supplemented by comparison with what the preconceived idea has held desirable. Judge each element of present systems against rules of good design, and compare them as well with poor designs. The first involves testing the system against some standard of excellence, the second is a matter of finding specific evidence of waste and/or inefficiency. [1:453]. The use of work flow-process analysis forms can be extremely useful in this evaluation.

A noteworthy consideration is that most organizations when instituting more mechanized systems involving ADP/EDP or IDP, have in developing a system for the machines, found that the new system would have produced greatly increased efficiency with the previous manual or semi-automated operations. They had just never examined their procedures closely before.

Controlling Systems. In paperwork systems as in other operations, good management and supervision is a requirement. Since paperwork reflects and touches on all elements of operations, the requirement for management excellence is no less than in the conventional areas and has rarely been properly achieved by office managers or administrators from the clerical ranks. To provide the desired information to top decision makers, the records manager should also be educated and experienced in administration, economics, business procedures, policy, quantitative methods and all of the other managerial requirements. His position, by whatever title it is called, should be in the horizontal plane of the upper management hierarchy.

With the knowledge and authority of the records manager other controls are also essential. Management must have a well defined statement of policy with respect to records management as well as definitive guidelines in the form of standard procedures, systems, and rules. One method of expression of these requirements may be in the form of a records management directive or manual, supplemented as required by an equally precise directives system. This document should thoroughly cover all aspects of:

1. Records creation
2. Forms, reports, and correspondence control
3. Handling of mail
4. Control of written instructions
5. Control of active records
6. Maintenance of inactive records
7. Records retention
8. Records disposal

9. Equipment and machines, etc.

Indications of Faulty Systems and Procedures [1:453]

A. Forms and Reports.

1. Shotgun distribution. Many copies distributed but few noted or acted upon.
2. Wastebasket copies. Many copies being thrown away at different locations upon receipt.
3. Double typed reports. Either too many copies or an improved method of duplication indicated.
4. Separate forms which might be combined and with a few lines of additional information serve multiple purposes.
5. Vague and misleading titles of forms which make the purpose of the form doubtful. Poor forms design is indicative of poor planning procedure.
6. Detailed reports in numerous copies which often rush both the originator and receiver.
7. Valueless reports received more than one period later than the period covered by the report.

B. Files and Records.

1. Files which are "there" but serve no useful purpose and are never referred to.
2. Obsolete files that have served a useful purpose which has expired.
3. Protective records justifying only departmental or personal past actions and of no value to the total organization.
4. Logs, records or other chronological documents

maintained for defensive purposes.

5. Duplicate files for cross reference rather than an efficient cross reference system for a single set of files.
6. Inactive records meshed or stored with active records.
7. Unfiled filing indicating the material might be destroyed rather than filed.

C. Questionable Work.

1. Checking which has little value. Eliminate 100 percent checking in favor of sample checking.
2. Routine initialing of approval or acknowledgement which has become a useless ritual.
3. Signatures to shift responsibility or blame, or which are automatic or protective and not worth the cost.
4. Frequent transcribing of information from one document to another indicating poorly designed forms or inefficient duplicating methods.
5. Detailed, routine work by highly paid non-clerical personnel such as checking, approving, routine writing, routine follow-up, record posting, or filing.

Controlling Records [3]

A. Correspondence. Next to forms, outgoing letters and internal correspondence constitute the greatest burden and cost of production to business offices. Frequently these items are too lengthy, are difficult to understand,

and generate further correspondence. They are often reviewed at too high a level which wastes executive time and slows the information flow. Control objectives are to limit volume, reduce cost, improve quality, and eliminate excess copies through:

1. Originator Responsibilities. Assigning proper title and subject, consideration of retention value, number of copies, and distribution of copies.
2. Receiver Responsibilities. Considering purpose and immediate use, assigning titles and retention codes, and destruction of excess copies.
3. Improvement of Letter Quality. Use of proper language in brief, concise, relevant style. Standards should be known and training should be given.
4. Development of Standards and Guides. Standardization of letter style, form, and punctuation to reflect the character of the organization and eliminate excess time and motion.
5. Application of Production Methods. Analyzing methods of creation, preparation and distribution of correspondence through process, procedure and flow charts. Gathering information on volume and kind of correspondence, production rates of machines and personnel, and number and relationships of steps in the flow of work. Studying suitability of

machines employed and available.

6. Dictation Methods. Appraisal and selection of methods: stenographer, machine shorthand writer, electric or acoustical dictating machines, direct typist or central recorder by phone.

7. Transcription Procedures. Training transcribers through programs, workshops, conferences and meetings in proper methods, use of equipment, elimination of lost motion, and the use of handbooks, manuals, and dictionaries. Providing information on new developments in materials, equipment and procedures.

8. Centralization of Activity. Examination of feasibility of using centralized dictation, stenographic pools, central transcription, and use of letter writing and dictation specialists. Elimination of departmental duplication of work and functions.

9. Copy Control. Controlling use of office copying and duplicating facilities. Limiting number of copies originated. Selecting most economical method of duplication.

10. Simplification and Reduction of Correspondence. Replacement of written correspondence with verbal communication. Delegation of routine correspondence and the use of form letters, guide letters, guide paragraphs, and routing slips. Use of automatic typewriters and flexowriters.

B. Forms. Forms constitute the most widely used type of business record. They are easier to prepare than other types of media but this often is responsible for the creation, distribution and continuation of unnecessary and superfluous forms. Too many firms have a limited concept of forms control programs. The objectives of such a program include prevention of the creation of unnecessary forms, controlling reproduction and outside purchase of forms, establishing uniform standards of design, and periodic review to assure elimination, combining and simplifying present forms. Important considerations are:

1. Pre-disposition of Forms. Prior to creating a form, determining need, charting forms life, assigning personal responsibility. Determining purpose, number of copies, distribution, preparation, and place and length of retention.
2. Forms Design. Arrangement of data, identification, spacing, headings and instructions, margins, grade and size of paper, printing type and assembly of copies.
3. Forms Analysis. Periodic inventorying of forms, reviewing sample copies, examining form histories. Eliminating, justifying, combining, and redesigning forms.
4. Forms Control Number File. Assembling visual files of all forms in a numbered sequence along with

pertinent information relating to all phases of use, approval, procedures, etc.

5. Forms Control Functional File. Bringing together forms and sections of forms serving similar purposes so they may be more readily combined; to prevent creation of a new form if an adequate one exists; to provide easy location by functions; and to provide company-wide procurement, simplification, coordination and standardization.

6. Control of Reproduction Methods. Approving the most economical method of producing forms in view of appearance, function, size, number of copies, distribution, etc.

C. Reports. Reports are the most expensive type of record to create. They convey information to management for control purposes and furnish other branches with information to carry out their work. The objectives of reports control are, elimination of reports not required; consolidation, simplification, and standardization of reports; the use of economical methods of preparation; elimination of excess copies and nonessential distribution; and the prevention of unjustified reports creation. The essentials involve:

1. Developing Economical and Effective Preparation. Determining cost and man-hours in preparing reports; reduction of costly executive preparation time through delegation; insuring timely, clear, concise

reports; and determining economical, effective presentation such as written, pictoral, or oral.

2. Evaluating Requests for Reports. Determining the degree of justification in terms of information contribution vs. cost.
3. Periodic Auditing of Reports. Reviewing reports inventory to insure timely action in eliminating, up-dating and combining. Reviewing objectives, functions, procedures, staff, and equipment used.
4. Reducing Number and Costs of Reports. Simplifying reporting procedure, eliminating routine information in favor of "exceptions," and reducing the amount of higher paid executive time in report reviewing.
5. Eliminating Nonessential and Unauthorized Reports. Discovering and discontinuing "bootleg" reports and unauthorized reproduction and duplication.
6. Improving Quality of Reports. Establishing standards of reporting format, brevity, clarity, and accuracy.
7. Identification and Coding. Properly assigning titles and control numbers to aid in detecting unauthorized reports, duplication, and overlapping functions.
8. Determining Individual and Total Report Costs. Obtaining and analyzing data for costs of gathering report information, report preparation, distribution and retention. Comparing cost of report, value of

information, and contribution to total system.

Controlling Records Storage. Effective management demands efficient controls over the maintenance and use of all types of records. Active records, vital for reference, must be easily accessible and rapidly available with their associated documents. Inactive records still vital to operations, but referred to infrequently, must be housed in low cost yet well protected storage. Large quantities of records without order can be worse than no records at all. Management cannot be served properly unless the requisites of speed, accuracy, and cost consciousness are observed in record filing, retrieval and storage procedures.

A. Centralized Records Control. Since the filing process serves all departments, control should be centralized for efficiency and economy. These savings and efficiencies include elimination of extra units of labor, space, supplies, equipment, and additional procedural steps, and decrease waiting time of executive and secretarial personnel.

B. Organizational Location of Files. The functional (decentralized) plan places files in one location, under one supervisor where they are most valuable to many persons concerned with a given operation--generally the department of origination. These units would still be under centralized control. Completely centralized files are maintained in one unit and one location. There are many advantages to completely centralized files, but the plan is more applicable to small organizations than large ones unless a rapid

transmittal or communication system can be installed.

C. Filing Methods. There are a number of physical methods available for records arrangement and the one selected as most efficient would depend on the required speed of retrieval, volume, number of referrals, space limitations, and other factors. These methods include: (1) vertical filing which has the records placed on edge in a drawer or shelf, usually in folders behind guides, (2) flat filing where papers are placed flat, horizonally in drawers or boxes of related groupings, and are generally removed en masse, (3) loose leaf filing for papers which are punched and placed in ring, post or prong binders, and, (4) visible filing with records in books, trays or racks displaying a visible edge for classification, captions or codes. Variations of the arrangements listed are frequently found in other forms such as hanging or rotary files. Methods utilizing automated retrieval and microphotography are the subject of later discussion.

D. Filing Procedures. [3] Standard procedures which should make up the filing system are often given little attention from the lines of authority, yet it is not a simple, unimportant routine that costs little. Good filing procedures are necessary to enhance the total system of records control. For this reason standard procedures should be known, preferably written,

and practiced at three stages: when records are created, processed, and released for storage. In this way all members of the organization are informed of the cooperative effort required for good records maintenance. Sound filing procedures include the following activities:

1. Classifying Records. Classifying records in accordance with the indexing system in use in order to provide proper placement in the files and to facilitate speedy removal when required. The originator and users of records are in the best position to insure correct classification, therefore they should be thoroughly familiar with the prescribed procedure.
2. Assigning Retention Value. The consideration of the retention value of a record by its creator including his assignment of a code to indicate this value, such as: destroy, after one reading; semi-permanent codes for follow-up or destruction in 30-days, 90 days, or 6-months to 1-year; and indefinite, which will be subject to periodic review. Users should assign codes to records which do not have them.
3. Releasing for Filing. Releasing records from use or routing for placement in the files by release marks of those responsible, such as initials or the use of the word "File." Released records should be collected periodically and not allowed

to accumulate, and should be sent directly to the filing center.

4. Checking Records for Filing. Indication of time of receipt at filing center followed by check for classification and retention code, page checking and physical preparation for filing.
5. Cross-Referencing. Creator, user, or releaser indication that cross-referencing is required when a record refers to more than one specific subject. Cross-reference sheet, card or folder is placed in alternate filing locations to indicate exact location of the record.
6. Follow-up. Preparation of follow-up slip, card or memo, for records which bear notations for this requirement before the record is filed. The follow-up is placed in chronological order to be acted on by files personnel at the designated time for return of the record to the requesting executive.
7. Storage Placement. Includes sorting, preparation of folders, ordering arrangement, physical preparation, and exact placement in files in accordance with classification and indexing system.
8. Reference Procedures. Withdrawal of records from the files should be accomplished by filing personnel only. A controlled charge out system should be employed for original records withdrawn. If originals are valuable and not physically required

for reference, a copying machine should be available to make the requestor a copy which he should retain and destroy rather than return to the files. Some form of substitution card should also be employed to indicate the position from which a record has been withdrawn. If a record is to be used by more than one source, transfer or routing slips should be available to filing personnel to permit tracing.

9. Follow-up of Withdrawn Records. A tickler file should be maintained and periodically inventoried to permit calling in or extending check-out times of withdrawn records.

10. Screening Files. All active records should be screened periodically in accordance with predetermined schedules. Screening may follow the predetermined retention schedule, periodic, or perpetual plans. Timely destruction and transfer to inactive storage is not only economically sound but prevents periodic backlogs from swamping the filing center. Transfer of records to inactive storage should be based on the information contained in the record and the number of times it is referred to not on the age of the record.

11. Other Considerations. There should be a firm destruction policy for records including responsibility for release for destruction, method of destruction, etc. The physical layout of equipment,

work areas, employee service facilities, conveyor systems and other features of filing centers should be as carefully considered as any other area in the office or factory. Careful planning should also be devoted to inactive, low cost, record storage in terms of layout and procedures which will provide maximum utilization of space, accessibility, and the proper degree of security and protection required. Finally, it is essential that a periodic analysis of all phases of record storage control methods and procedures be conducted to insure that the system is carrying out the objectives of management in an efficient, economical and up-to-date manner.

Controlling The Retention of Records, [30]. As long as a record is actively referred to over a reasonable period of time, it should be retained. When records are referred to infrequently, or the probability is slight that they will ever again be required for any useful purpose, they should become prime candidates for removal from storage and for destruction--unless a statutory provision or some other element of intrinsic value indicates otherwise. "An objective attempt to determine the value of a given group of records requires finding a reasonable and logical midpoint between two extremes--that all records should be retained forever and that all records should be destroyed immediately." [30]

A. The Decision To Retain or Destroy. There must be a sound basis upon which the decision to pay for the cost of retaining records or destroying records to

reduce costs is based. This basis is a matter of organization policy but must include the following considerations:

1. Administrative Value. Value based on frequency and extent of reference to the record. This group of records should be retained as long as a genuine and demonstrable reference value exists unless, information required less frequently can be secured elsewhere, or the cost of retention outweighs the reference value.
2. Volume of Records. If records can be preserved conveniently and economically, they should be preserved in original form as long as possible value exists, however, they should not have to be completely without value to merit destruction. The determination is when they are no longer of sufficient value to warrant their maintenance.
3. Historical Value. Records should be retained when they provide useful background for future management decisions and assist personnel in understanding the objectives and activities of the organization.
4. Research Value. Records which contain potential research value should be identified specifically as such on the retention schedule and maintained accordingly. Aside from the potential value to the organization, release to other organizations should be on approval of top management.
5. Legal Value. Records of this nature usually serve

as proof of claims or transactions and are generally subject to statutes of limitations or other government regulations specifying minimum retention periods. Hazy ideas of the law and "play-it safe" attitudes frequently serve in place of actual requirements in setting up retention schedules. Federal requirements are available from the Government Printing Office and State and local regulations for various types of paper may be acquired from numerous records management services or state agencies. The expense of such information is a sound investment. [38]

6. Evidential Value. Evidential records may have to be retained to support or explain other groups of records. Their need should be weighed probabilisticaly against the self sufficiency of the basic records, the adequacy of summary records or the justification of the cost of retention.

Employing Microphotography in Records Management. [3, 4, 24]. Microphotography is commonly referred to as microfilming and is the copying of records on film in sizes greatly reduced from the original document. Image reductions, for records, of 40 to 1 and, for engineering drawings, of 24 to 1 are now readily obtainable and recent innovations can reduce images 200 times. It is estimated that in the near future photographic size reduction may reach 10,000 to 1. Microfilm records presently require about two percent of the space requirements of the original documents. Microfilm requires the use of a viewer to see the filmed record and a photographic

copier if it is desired to produce copies from this film.

A. Advantages of Microfilming. Microfilming is most useful where a large volume of records must be maintained for long periods and economies can be obtained from the reduction of file space requirements. To achieve this, it must not be mandatory that the original document also be retained. The reduced size files can be moved with little effort and materials such as blueprints can be handled more readily, and can be searched for and transmitted more easily. This process is also valuable where duplicates of vital records must be retained, and for producing copies of records for use of other sections not holding the original record. Microfilm is now being successfully coupled with rapid, automated record retrieval systems. Conventional microfilm files are maintained in film rolls and may be produced in the same or different order of indexing as original files. Automatic retrieval devices may also utilize microfilm in the form of tiny film chips, aperture cards which combine the film and punched cards or other forms. Even with manual microfilm filing, records whose location are readily known can be obtained, viewed and reproduced within a one to two minute interval.

B. Disadvantages of Microfilm. Although microfilm will last as long as the best bond paper there are certain

environmental requirements for maintaining normal humidity and temperature conditions to prevent deterioration of the film. This method of filing lacks the full flexibility of paper records since the process will not at present photograph colors, additional written information cannot be added to a document, and documents cannot be sequentially inserted in the files when the microfilm is retained in roll form. There may be cost considerations which prohibit the use of microphotography since cameras, viewers, and reproducers must be purchased or rented along with associated supplies, and the possible necessity for re-indexing or preparing unwieldy records for filming can generate excessive costs.

Microphotography offers increasingly greater sophistication to enhance records management systems, however, as with other techniques, it must be properly evaluated and utilized only where it provides adequate flexibility, economy and efficiency.

Clerical Personnel Practices. [28]. In the years since World War II, management has been forced to attempt to get employees to do more effective work for their money. With the clerical workers growth rate exceeding that of production workers and indications of shortages of skilled clerical workers for the future, more emphasis has been centered on office worker employment policies and productivity to cut the cost of paperwork.

A. Hiring Clerical Workers. Increased business and systems complexity demands higher clerical skills and has resulted in fewer available workers. Many businesses are now devoting more effort to employee selection methods and hiring standards. Some have found available, older workers a source of considerable clerical skill, notably that of accounting clerk and similar positions. References are being more closely checked and the demand is now for more education and experience. More reliable testing is being sought to select good potential clerical workers and attention must now be directed to office environment to lure experienced workers and retain them. Emphasis is tending toward greater quality and less quantity in clerical personnel.

B. Clerical Training. Often organization training programs of considerable duration must be undertaken in order to even start relatively low skilled workers such as file clerks. Office workers in many cases require seminars, lectures and other training to keep abreast of new procedures and equipment. Outside training is necessary in some cases and can often be obtained from programs sponsored by equipment manufacturers. Workers must be trained in greater varieties of work and in a greater number of machine operations. Many training programs in recent years are concentrating on breaking different jobs down into similar components which permit workers

from several operations and offices to be trained simultaneously. This also provides a degree of flexibility to shift personnel to different clerical jobs.

C. Clerical Production. In addition to better supervision and more thorough training many industrial personnel production techniques can be readily applied to the office force. Production can be increased by the use of clerical procedures manuals, accurate job descriptions, work measurement, and merit rating systems. Work must be scheduled tighter, interruptions eliminated, and heavy peak loads leveled out through greater interdepartmental coordination and thorough analysis of employee paperwork or process production records. Tying compensation to output is effective for clerical workers as are other incentives such as higher salaries and early release from work when a specified volume has been completed. Greater flexibility can be obtained to cope with heavy work loads and vacation periods through temporary interdepartmental transfers and the use of work pools.

Automation in Records Management. [3, 41]. Once management has accepted the area of paperwork as a problem center from which gains in efficiency and reductions in overhead costs can be obtained, the willingness to apply conventional control procedures can usually be instituted with little question. Most managers today would, in addition, wish to go even farther in applying proven automated procedures to achieve further cost reductions. Most of the systems can

be readily adapted to automation with perhaps the exception of the problems of correspondence. Even in this area help is available in the form of miniturized, easily operated, efficient, dictation or recording machines; automatic typewriters which make every copy "an original;" and rapid copying machines to reproduce more copies faster and more readable than carbons.

Business systems are particularly adaptable to automatic data processing in various degrees, and much of the administrative system can be automated, particularly where EDP or a computer is available. The degree of ADP employed will depend on the size and volume of the operation as well as speed and number of automatic processes desired.

> Before the installation of any electronic machines for data processing, a careful analysis of existing paperwork systems and procedures should be made. This analysis may show that the electronic equipment is not needed, or it will make the installation of the equipment more efficient and less costly. The use of electronic equipment requires that standardized systems and procedures be used. [3:244]

Automatic processing of data can be broken into three general categories.

A. Basic or Hand-Machine Processing. The most basic degree of automation is the use of hand operated machines by personnel who carry out the various steps of a system. This involves the use of such machines as the typewriter, adding machine, hand calculators and posting and accounting machines. Such operations require less capital outlay, are flexible in allocating time and labor, and require less operator training, however, certain disadvantages

may also be incurred in such simple systems. These include costly duplication of effort, peak load, paperwork bottlenecks, greater chances for error, high labor cost per unit transaction, lack of systems discipline, difficult and costly management reports, and a general lack of speed.

B. EAM Systems. Electronic Accounting Machine systems are often referred to as tabulating or tab card systems since the primary operation involves creation of unit records in tab or punched card form. The unit records are processed either independently or in conjunction with other unit records through various EAM units to produce the desired results automatically. A number of other machines are also necessary to the EAM process. These are:

Key punch machines	For punching cards
Key verifiers	For verification
Sorters	For sequencing cards
Collators	For merging various cards
Calculators	For calculating and punching results
Tabulators	For tabulating and printing
Reproducers	For duplicating punched cards
Summary punchers	For punching summarizations
Interpretors	For printing card files

The process is applicable to large operations involving such records as accounting, billing, inventory control, production control, sales, and personnel. Where very large volumes of data are required to be processed and reported in minimum time with high accuracy, the EAM system is very economical. It also provides systems discipline and allows for systems integration. Management reports are more timely

and easier to prepare, peak loads are reduced, neat and accurate records are produced, work duplication is reduced, and by-products in the form of automatic summarization, automated calculation and automated outputs result. Disadvantages of EAM systems are found in the much higher costs associated with equipment purchase or rental, more expensive personnel requirements, the cost of creating machine readable documents, and machine space requirements. In addition, personnel turnover can create problems, communication between data processing and other personnel can frequently create difficulty and, of course, "down-time" of machines can bog the process. It is also a very complex matter to revert to, or partially introduce hand-mechanical systems.

C. EDP or Computer Systems. Computers, at present, can be installed only by the largest commercial corporations and Government agencies because of the tremendous expense associated with the lease or purchase of the equipment and the elaborate space and environmental requirements necessary for operation. In addition a relatively high usage time is required to create an adequate return on the investment. As time goes on however, more compact and specialized models are appearing at greatly decreased prices, and companies called service bureaus have been formed to provide the advantages of full computer services to small

businesses which cannot afford such installations.

The digital, electronic computer, with which we are here concerned for business purposes, is capable of performing basic mathematical calculations at fantastic rates of speed. Inputs must be programmed in the computer's "machine readable language," compatible with the set up of the manufacturer, and then input with raw data to complete the computations. These programs can be used over and over again as data changes, or minor changes can be made in them as the desired operations change. Sub programs can also be called upon at specific times, automatically by the computer, to augment the program in process. In addition to specific programs which can be called into an operation, a large amount of data can be stored in the computer's memory for use with complex programs.

Because of the ability of the computer to solve repetitive formulae for large masses of data in times which compress man-days into minutes, it has been considered most useful for scientific purposes. With the expansion of programming to accept business-management languages in a large variety of situations, the ability of the machine to rapidly calculate mathematical and statistical formulae, evaluate hypotheses, select alternatives, and conduct vast simulations, makes it a prime candidate to some day provide an ultimate management information system.

The accuracy achieved by computers is much higher than for other types of machines, and greater control is possible, since data are handled without human intervention. This type of operation favors heavily an integrated system of control for all records and paperwork activities since data can be readily stored on tapes or cards for use without the handling of intermediate paperwork.

The computer has already shown that it can take over humdrum chores to relieve managers and other personnel of much of the routine and tiresome work of processing information, as well as an ability to supply instantaneous information about things as they happen. In information retrieval, computers can sift masses of data rapidly in search of scattered pieces of information.

Many banks are now using computers to process checks and documents with a common machine language, Magnetic Ink Character Recognition - MICR, with the result that even though check volume has increased 25 percent in the past three years, the number of bank clerical workers has remained constant. [9]

A manufacturer with over 7,000 employees installed a computer operation which cut his payroll staff 50 percent and completed in six to seven hours the task that had formerly taken the full staff up to four days to accomplish. The cost of preparing a check was reduced from two dollars to fifty cents. [9]

American Airlines utilizes a central computer and long distance data transmission to operate a centralized ticket reservation service. The system stores up-to-date information on all flight reservations. A ticket agent in a distant city has access to the computer through a sending-receiving unit, and when a reservation is desired he forwards the information for the desired flight number, date, and number of seats. In seconds, the machine confirms the reservation by a flashing light or transmits a message giving listings of alternate flights on which space is available. Once booked, the computer stores the customer's name, address, and telephone number. Although this computer network cost $30.5 million, it is reducing the airlines clerical cost by eliminating the many file searches and telephone calls previously required and is improving customer service. [9]

One of the most advanced computer systems in existence is now operated by the Westinghouse Corporation and indicates things to come. As an example, an order for an electric motor from Fort Worth may be received by the computer in Pittsburgh via teletype. Within four and one-half minutes, the computer can locate the motor in stock nearest the customer, adjust inventory records, reorder stock from a designated factory if inventory level is low, compute sales price, discount, and sales tax, type out the invoice, and dispatch the order to the

correct warehouse. The warehouse would receive the teletyped order, bill of lading, carton label, and instructions to the clerk for the correct bin where the motor is located. The previous process would have taken three to five days and the expenditure of much clerical effort. A Westinghouse official has indicated that in the near future, continuous sales and cost information from outlying facilities to the computer may provide management with instantaneous profit and loss statements which are now available only once a month. [9]

The Government was one of the first to employ computer systems on a large scale and now has numerous huge installations in existence compiling the census, reviewing Income Tax Returns, retrieving scientific data as well as hundreds of other applications. (14) The Defense Department is the largest user of computers in the Government and besides its conventional decentralized installations for personnel matters, inventory control, payroll preparation, etc., has taken great advantage of the system for Pentagon cost effectiveness analysis and control of the defense budget.

Automated Information Retrieval. [3, 4, 24] Automated information retrieval systems are divided into two types of systems based on the form of the information stored. One category stores large volumes of simple data or information bits, and through high speed random access devices processes the data into meaningful

information. The other type stores duplicates of original source data in the form of microfilm, video tape or a similar medium and relies on mechanical, photoelectric, and in some cases, EDP systems for retrieval.

A. Computer Retrieval. The most efficient use of the computer is made by taking full advantage of the machines capacity to perform high speed manipulations. When data can be stored or input as units of information, particularly as original source data rather than from documents, the system can rapidly search for, retrieve, and perform operations with data, and produce the results in several media forms. Both input and output can be in the form of punched cards, punched tape or magnetic tape and additionally output may be presented as typed paper or by cathode ray tube from which microfilm prints can be simply made. Permanent records or memory units can be provided for the computer by disc or drum storage files.

Since much of the information desired by management is in the form of correspondence and original source documents, the use of a costly computer installation to merely produce re-typings from its memory would be extremely costly and wasteful. The process would involve converting paperwork to an input medium for future reconversion back to paper. Microfilm can provide a compromise to make computer record retrieval more efficient through the medium of aperture cards. These cards are regular punched cards which contain a

small square of film upon which numerous pages are photographed. The computer can then locate and deliver the desired material rapidly using the normal indexing method or through cross-indexing to fit a variety of situations.

B. Photomemory Systems. Photomemory units are basically centralized storage devices for microfilm records. The microfilm records may be in reel form or separated into tiny cards called "chips" and are enclosed in some form of storage cannister or cartridge which form a part of the indexing system. Normally a small section of the film is devoted to magnetic spots or some other coded form to indicate indexing, cross-indexing, or subjects, which are scanned by the photomemory unit in the retrieval process. By manipulating a series of keys in sequence with the desired search pattern the microfilm is delivered rapidly (10 to 25 frames per second) past the photocell selector which scans the machine readable code and presents the desired document (s) to the operator on a viewer, or rapidly prepares a paper copy before refiling the film unit. With some equipment it is possible to employ photo posting techniques to add information to the minature microfilm documents.

C. Separated Search System and Records Storage. Other systems that do not combine storage and retrieval systems have been developed to assist in finding

records pertaining to a specific subject from among large, complex filing systems. An example of one such system employs cards pertaining to key terms and individual documents in the files. Search is made for a combination of terms by mechanically superimposing cards over a light source and observing the coded holes through which the light appears as dots. The position of the light dots may indicate the file serial number where the desired document will be found or pinpoint exact physical location if cards containing a print of the document storage area are used.

D. Integrated Data Processing and Source Data Automation. The goal of efficient and economical paperwork management is not only to eliminate excess paperwork but to reduce the amount of presently required paperwork. This goal sees the possibility in present technology to accomplish both ends in future automatic and electronic data processing systems. Through Integrated Data Processing the intermediate production of paperwork and decisions, and the delays associated with these steps can be eliminated by machine to machine instructions, produced as output data and accepted by succeeding machine operations as inputs. Such integration is now possible in large highly automated processes but at the moment is extremely costly and available only to larger organizations. The logic of IDP is, however, applicable to smaller

manual-machine systems as well as completely manual systems since the basis of operation is a well defined system refined to eliminate all but optimum necessary operations.

The computer is in itself an integrated system but has as yet not been practically integrated with less complex or other computer systems. A large part of the problem of integrated computer systems is caused by diverse program languages created by different manufacturers for a variety of specialized fields with relatively little effort having been expended to develop common, machine readable, transfer mediums.

If the elimination of intermediate paperwork is a desirable objective, the elimination of original creation of such paper is even more desirable. Such an accomplishment is referred to as source data automation. SDA is the initial input to automated systems of the source data rather than excerpts from documentary forms which require conversion to an input medium. With this system, no paper is created until information is called forth by management. The decision makers are then not troubled with unnecessary reviews of normal operation of the system but may obtain data when it is required, on a momentary basis. They will as well have the capability of being warned of actions exceptional to the system. The source data, integrated system would

contain the organization memory and up-date this memory while handling operational information in errorless fashion, as instructed, and produce its reports rapidly, on demand.

E. A Word of Caution. With the birth of data processing and its rapid growth in a short life, the expectations for huge gains in information systems and paperwork control have been tempered by a new realization:

> Records management continues to grow in importance with the increase of data processing costs. The use of electronic computers and the ease with which information can be produced increases the desire of some members of management for more information. Electronic data processing may supply executives with so much data that top executives will realize too much data can be as harmful as too little.
>
> ....
>
> In many organizations, the creation of recorded information by computers has created a problem of storage for records administrators. In many cases, three copies of the information are retained, the source document, the medium that is conveyed by the machine, and the finished document. [3:272]

> The possibilities of paperwork reduction through or as a by-product of electronic data processing (EDP) in the Federal and State Governments is enormous.
>
> ....
>
> But, major paperwork savings to the public as a result of electronic data processing are all in the future. In fact, to date computer technology shares the responsibility for increasing Federal reporting requirements. [15:47]

Summarizing Present Action. In that portion of the business community now recognizing the effects of excess paperwork, the attack on the problem has been launched with the aid of all of the tools described in the study. Management is employing:

1. Increased top level attention to records control.
2. Improved management of paperwork activities.

3. Attention to systems analysis and the development of more efficient systems to replace present ones.

4. The conventional sound practices to control records creation, filing, retrieval, storage and destruction.

5. Increasing automation, automatic data processing and electronic data processing.

6. Increased attention to clerical personnel practices to obtain greater productivity.

7. Integrated data processing and source data automation where it is available.

In the Federal Government the congressional subcommittee indicated in its conclusions of the Federal Paperwork Jungle Report that the same practices employed by business are also required in the government agencies with a special emphasis on not only reducing the cost of paperwork but also the elimination of the double costs associated with the reporting burden placed on the public. To implement the attack on paperwork the subcommittee called for:

1. Increased congressional attention and control.

2. Increased power of, and additions to the functions of, control agencies.

3. A "team approach" to the problem among the various departments and agencies.

4. Increased public participation and advisory services.

5. Increased public relations concerning Federal report requirements.

6. Intensified training in paperwork activities.

Project SCRAP commenced its paperwork reduction activities in the Navy and Marine Corps on 1 July, 1964. A summary report from the Office of the Navy Inspector General on 4 December, 1964, indicated the following achievements: [19, 20]

1. The pruning of directives files at the individual command level throughout the Service had resulted in

elimination of 18,402 directives (8.3 percent of the total number in effect), and the improvement of 22,552.

2. Instituted a study to determine the true cost of selected departmental periodicals.
3. Reduced the allowances of Naval Tactical Doctrine Publications held unnecessarily by the operating forces by 15,300 copies. This reduces preparation and printing costs and manpower required to enter changes, as well as space requirements.
4. Initiated a revised instruction for the operation of the Navy Directives System.
5. Prescription of a new Navy Standard Letter form to reduce effort and cost.
6. The collection of data from several fleet units to determine the feasibility of automating reports at that level.
7. Receipt of large numbers of profitable suggestions from personnel throughout the Fleet in response to SCRAP's personnel suggestion campaign for reducing paperwork.
8. Continued progress in efforts in a multitude of areas promising to lead to a reduction of reporting and paperwork requirements.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Each year the volume of paperwork increases because of the rapid expansion of business, technology, scientific and engineering information, archives, statistical services, enlargement of governmental functions, etc. The growing volume is abetted by rapidly increasing numbers of people associated directly with paperwork operations, a host of new machines available to indiscriminately assist in the production, and the desire of all levels of management to be continuously and completely informed. The volume of paperwork is reaching such astronomical proportions that it appears management will be informed more and more about less and less, or vise versa. As management is forced to cope with ever increasing stacks of paper, the ability to sort the wheat from the chaff is greatly reduced and a price is paid for the loss of vital information as well as for attention devoted to inconsequential information--this cost is in addition to that of producing all of the paper in the first place.

It has been indicated that business wastes up to $600 million annually in excess paperwork; the Government's bill for processing paper can be easily as high as $20 billion a year; and the U. S. Navy has found its combat capabilities seriously eroded by mountains of paper. The impact of such efforts represents a serious economic waste. Even if a relatively small portion of total paperwork could truly be labeled excess, the dimensions of the costs are so tremendous that the excess portion would represent a staggering sum. The problem extends beyond that of elimination of needless paperwork, but encompasses also the need to generate efficiency of paperwork

ideas, systems, and goals in order to reduce the expenditure of manpower and money for essential paperwork and records. In short, improved information systems represent the greatest potential savings.

The constant growth of business will create ever new problems but as long as the seriousness of the paperwork threat is recognized, sound procedures and tools are available to combat the situation and newer tools for this purpose are in continuous development. Perhaps one hundred percent control will never be accomplished if only because such a definition would be extraordinarily hard to achieve. Managers whether large or small, civil or government, must recognize the costs of inefficient and excess paperwork, and devote adequate resources to the problem. They must delegate authority, and seek greater control through management by exception with regard to reports, records, and information systems. Probabilistic attitudes must be adopted towards retention of records just as employed in other decision making areas; the office worker should be made as productive as the industrial worker; and when governmental paperwork requirements become overpowering, the democratic processes should be utilized to achieve a change in the requirements. Although data processing systems represent a vast potential for improvement of information handling techniques, they must not be allowed to contribute needlessly to the mountain of nonessential paperwork or the great potential may become only an additional burden.

Recommendations

The greatest difficulty associated with paperwork is the lack of standardized information regarding its control and the shortage

of knowledgeable people in the field. To overcome these shortcomings intense research must be devoted to records management and information systems; colleges and universities must educate future business and management students in methods of control and sound procedures, as well as conduct a portion of the research required; and more assistance and sources in the form of research, textbooks, and handbooks, must be prepared and distributed.

Dr. Manual R. Piore, Vice-President, Research and Engineering, I B M, has stated:

> One of the greatest technical problems today is that of information--how to make relevant, reliable and complete information available to all who need it and when they need it. [24]

The Federal Paperwork Jungle Subcommittee concluded its report on paperwork in government with this appeal:

> This subcommittee urges strong Congressional support for further Federal Paperwork Management research. It also highly recommends that universities, institutes and other private organizations undertake similar investigations in the private sector. This attention is long overdue. [15:54]

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APPENDIX

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

DEPARTMENT OF THE NAVY
ADMINISTRATIVE OFFICE, NAVY DEPARTMENT
WASHINGTON, D. C. 20360

5 FEB 1965

LCdr. H. W. Davidson Jr., USN
U. S. Naval Postgraduate School
Box 2265
Monterey, California

Dear Commander Davidson:

Your letter to Mr. E. Dwyer, Chief, Navy Management Office, of 12 January 1965, was forwarded to this Office for reply since: (a) the Navy Management Office was disestablished by SECNAVNOTE 5430 of 21 November 1964 and administrative paperwork programs transferred to the Administrative Procedures Division, Administrative Office, Navy Department; and, (b) Mr. Dwyer is now associated with the General Services Administration.

In considering the paperwork management field for your research paper you will be selecting a subject of limitless possibilities. While it has the advantage of extreme scope for which considerable information is available, this very scope may have the disadvantage of precluding treatment of the subject in depth unless the scope is somewhat narrowed. A narrower approach might treat of paperwork as related to Fleet readiness, in the information systems context, as the principle means of communication (reports, retrieval, etc.). These are only a few presumtious suggestions as to how this subject, which is as broad as contemporary man's total effort, may be approached without your becoming entrapped in the profusion of problems, techniques, and mechanics that exist in paperwork management and reduction.

We are actively working with the Project SCRAP personnel and Mr. Hugh Jackson has been in touch with us concerning your letter to him. He will reply to you concerning Project SCRAP. Enclosed is a list of various NMO publications that you may find useful in developing a paperwork bibliography. Although some may not be available we will attempt to obtain what you determine is needed for your paper.

APPENDIX

STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA 94025

February 24, 1965

Lcdr. H. W. Davidson, Jr. USN
U.S. Naval Postgraduate School
P.O. Box 2265
Monterey, California

Dear Lcdr. Davidson:

Your letter of January 12 addressed to Mr. Everett S. Calhoun has been received. Please accept my apologies for the delay in answering your request.

Mr. Calhoun has been on an extended trip in the East and has asked me to respond to your letter regarding references, sources and/or bibliography in the area of paper work explosion. I am enclosing the Bibliography of Mr. Calhoun's Long Range Planning Report No. 218, The Office Paper Explosion. This report is one of a series published by Stanford Research Institute as a part of its Long Range Planning Service. As the series is available to companies on an annual contract basis, reports cannot be distributed individually. We regret, therefore, that we are unable to send you a copy of the report.

Also, we are enclosing a reprint of an article by Mr. Calhoun which is based on a speech he delivered to the Business Equipment Manufacturers Association. We hope these papers will be of some assistance to you in your work.

Practice American principles ▪ Make self-government work

Chamber of Commerce of the United States
1615 H STREET, N.W. ▪ WASHINGTON, D.C. 20006 ▪ NATIONAL 8-2380 / AREA CODE 202

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RCH 5
Orleans, Louisiana

February 1, 1965

Lt. Commander H. W. Davidson, USN
U. S. Naval Postgraduate School
Box 2265
Monterey, California

Dear Commander Davidson:

In response to your letter of January 24, the National Chamber's interest in the current paperwork dialogue is related pretty directly to the outlook for legislative or administrative recommendations for easing the burden of federal forms, questionnaires, etc., which are directed to business firms.

If this subject is of interest to you, I would suggest that you write directly to Representative Arnold Olsen, U. S. House of Representatives, Washington 25, D. C., and ask for a copy of the record of hearings he conducted last year on the "federal paperwork jungle." This deals rather extensively with a great many paperwork problems -- and, while it reflects some concern over the efficiencies of data processing techniques, it also explores other "improvements", such as eliminating unnecessary forms and avoiding duplicate requests.

My guess is that this record of hearings would be very useful to you.

APPENDIX

EIGHTY-EIGHTH CONGRESS

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House of Representatives
SUBCOMMITTEE ON CENSUS AND
GOVERNMENT STATISTICS
OF THE
COMMITTEE ON POST OFFICE AND CIVIL SERVICE

February 17, 1965

Lcdr. H. W. Davidson, Jr., USN
U. S. Naval Postgraduate School
Box 2265
Monterey, California

Dear Mr. Davidson:

In accordance with your request of February 9, I am forwarding under separate cover a set of the "Paperwork Jungle" hearings, Parts I - V. You will also receive a copy of our report when it is released later this month.

You are absolutely correct in your statement that information concerning Government and private industry paperwork is quite thin. We think we are beginning to fill some of the gap in the Federal sector, but little is available here about State and local government reporting. Some of the best work being done in the private sector is being done in the Stanford Research Institute in Menlo Park, California. They recently released a study, "The Paperwork Explosion" by Everett S. Calhoun, which you should see.

Would like to hear from you again after you review our materials.

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